Recall: Strategy $a_i^+ \in A_i$ is strictly dominated by $a_i^* \in A_i$ if for all $a_{-i} \in A_{-i}$:

$$u_i(a_{-i}, a_i^+) > u_i(a_{-i}, a_i^+)$$

Algorithm: Iterated elimination of dominated strategies.

1. If possible, eliminate a dominated strategy of some player (leading to game $G'$), else terminate.

2. Go to 1.
IESO can be applied with weak or strong dominance.

Example (strong dominance):  

<table>
<thead>
<tr>
<th></th>
<th>L</th>
<th>C</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>2,0</td>
<td>1,1</td>
<td>4,2</td>
</tr>
</tbody>
</table>
| M | 4,1| 1,1| 2,3| NE of only game
| B | 4,3| 0,2| 3,0|  

- **(1)** dominated by **R**  
- **(2)** strictly dominated by **R**  
- **(3)** dominated by **T**  
- **(4)** strictly dominated by **T**
Example (with weak dominance)

<table>
<thead>
<tr>
<th></th>
<th>L</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>2,1</td>
<td>0,0</td>
</tr>
<tr>
<td>H</td>
<td>2,1</td>
<td>1,1</td>
</tr>
<tr>
<td>B</td>
<td>0,0</td>
<td>1,1</td>
</tr>
</tbody>
</table>

Two remaning solutions: 
- (2,1)
- (1,1)
Remark: Result of RemS with weak dominance is not unique (neither in terms of remaining action profiles nor of remaining payoff profiles.)

Lemma: Let G be a strategic game and G' be the game resulting from eliminating one strictly dominated strategy from G. Then the NEs of G are exactly those of G'.
Proof: Let \( a'_i \) be the eliminated strategy. Then \( \exists a^+_i \ s.t. s.a. \ a_{-i} \in \mathcal{A}_{-i} \):

\[ u_i(a_{-i}, a'_i) < u_i(a_{-i}, a^+_i) \quad (1) \]

\[ \Rightarrow \] Let \( a^* \) be an NE of \( G \). Then

\[ u_i(a_{-i}^*, a^*) \geq u_i(a_{-i}^*, a_{-i}^{||}) \quad s.a. \ a_{-i}^{||} \in \mathcal{A}_{-i} \]

\[ \Rightarrow u_i(a_{-i}^*, a^*) \geq u_i(a_{-i}^*, a^+_i) \geq u_i(a_{-i}, a_i) \]

\[ \Rightarrow a^* \neq a'_i \Rightarrow \text{NE strategy was not eliminated} \]

\[ \Rightarrow a^* \text{ still } \text{NE in } G! \]
Let $a^*$ be a NE in $G^i$. Then:

For players $j \neq i$ : $a_j^* \in B'(a_{-j}^*) = B(a_{-j}^*)$ (no strategy of player $j$ was eliminated.)

For player $i$: $u_i(a_{-i}^*, a_i^*) \geq u_i(a_{-i}^*, a_i)$

\[ \Rightarrow a_i \text{ no better response to } a_{-i}^* \text{ than } a_i^* \text{ (in } G) \]

\[ \Rightarrow a_i^* \in B(a_{-i}^*) \Rightarrow a^* \text{ also NE in } G. \]
Corollary: If PEDS with strict dominance results in a unique strategy profile $a^*$, then $a^*$ is the unique NE of org. game $G$.

**Proof:** Inductive application of previous lemma.

Remark: PEDS with strict dominance does not depend on elimination order.